

System Configuration Team (SCT)

Reasonable & Prudent Measure #26

Meeting Notes

August 14, 1998

I. Greetings and Introductions.

The August 14 meeting of the System Configuration Team was held at the National Marine Fisheries Service's offices in Portland, Oregon. The meeting was co-chaired by Bill Hevlin of NMFS and Jim Ruff of the Northwest Power Planning Council staff. The meeting was facilitated by Donna Silverberg, who offered some introductory remarks about her background, as well as some suggested ground rules. The agenda and a list of attendees for the August 14 meeting are attached as Enclosures A and B.

The following is a distillation (not a verbatim transcript) of items discussed at the meeting, together with actions taken on those items. Please note that some enclosures referenced may be too lengthy to routinely include with the meeting notes; copies of all enclosures referred to in the minutes are available upon request from Kathy Ceballos of NMFS at 503/230-5420.

II. FFDRWG Updates.

John Ferguson of COE provided a brief update on items discussed at the July 27 FFDRWG meeting; no issues were raised at that meeting that required further discussion at SCT. He distributed a written summary of the updates presented at the July 27 meeting, attached as Enclosure C. Please refer to this document for details of Ferguson's presentation.

Rock Peters led a discussion of the NMFS and CBFWA proposal on fast-track flow deflector construction at Lower Granite, Little Goose, Lower Monumental, Ice Harbor, McNary, John Day, The Dalles and Bonneville Dams. Peters distributed Enclosure D, a preliminary Corps draft of a scope of work, including details on potential project modifications, tasks, schedule and costs; please see this document for details of Peters' presentation.

Peters emphasized that the schedule and cost information included in this scope of work is a study schedule only -- it does not include any construction or final plans and specifications. Essentially, he said, this is what is needed to get us to the final plans and specs stage. He requested that the SCT provide any comments on this scope of work to him as soon as possible, and said he will then convene a special FFDRWG meeting to discuss them. Please note that the current gas abatement budget does not include this fast-track approach, Peters said -- I want to be very clear about the fact that it will cost an additional \$2.4 million in FY'99 if we are to proceed with flow deflector installation as outlined in this scope of work.

Mike Mason said that most of the relevant information to be covered from the recent

Walla Walla FFDRWG meeting will be addressed under the discussion of Lower Granite surface bypass evaluation results (Agenda Item V).

CRITFC's Tom Lorz asked about the status of the Dworshak Hatchery temperature control project – my understanding was that that work was to have been completed this year, he said, but according to hatchery personnel, they still can't handle water temperatures lower than 48 degrees. Mason replied that it is his understanding that that work has been completed; he said he will check with the hatchery and report back at a future SCT meeting.

III. Update on the Evaluation of Grand Coulee Gas Abatement Alternatives.

Reclamation's Monte McClendon said a meeting between representatives from the Bureau, EPA, WDOE, the Colville Tribe was held July 23 in Boise; at that meeting, EPA determined that the Bureau of Reclamation will not be held responsible for high TDG levels above Grand Coulee Dam, but will be responsible for abating gas generated at the dam. Also at the July 23 meeting, WDOE said they will be pursuing total maximum daily load (TMDL) designations for gas in the Columbia system; they indicated that they want the Corps and Bureau to get together on a combined study at Grand Coulee and Chief Joseph. WDOE would also like to work with the Dissolved Gas Team to revisit the spill priorities for 1999.

McClendon said that, at another meeting on July 30, Kathy Frizell of Reclamation's Denver office had provided an update on the Grand Coulee gas abatement alternatives; the current plan is for Frizell to provide another update, touching on results from the appraisal-level study of those alternatives, at the October SCT meeting. The five alternatives currently under consideration will be reduced to three, to be carried forward in the full feasibility study, McClendon said; at the October SCT meeting, we'll be presenting the three alternatives we would like to see carried forward. To provide an opportunity for technical input on the engineering aspects of the appraisal-level study, Reclamation has scheduled a meeting for October 22, here in NMFS' Portland offices, beginning at 8:30, he added.

Following that meeting, Reclamation will accept comments on the study for one month, McClendon said. Following the November SCT meeting, he said, we would like to come to closure on the appraisal-level study, because we need to get to work on the feasibility study -- it's a two-year process.

McClendon touched on some of the design criteria that will be used in the Grand Coulee study, including the flow and TDG levels that will be applied. He added that, at the July 30 meeting, Alec Maule had also provided an update on the three-year biological study he will be conducting on the impact of dissolved gas supersaturation on the native fisheries in Lake Rufus Woods. The study will start in FY'99; Maule is in the process of detailed study planning. The plan is scheduled to be complete by September 1, at which point it will be sent out for a one-month peer review. If anyone wants to see a copy of the plan, please let me know, McClendon said.

At the last SCT meeting, we talked to you about adding the weir labyrinth alternative to your list for Grand Coulee, said Jim Ruff – was that alternative discussed? Briefly, McClendon replied, but as I said, EPA is now saying that Reclamation is not responsible for abatement of

high TDG levels coming down from Canada. Because of that change, the alternative you're referring to is kind of a moot point.

My understanding was that we were going to look at gas abatement at Grand Coulee in a systemwide context, said Rod Woodin of WDFW – I'm concerned that the Bureau may be throwing out alternatives that may have systemwide benefits. The systemwide study is going to proceed, McClendon replied – I'm just telling you that this is how we intend to proceed at Grand Coulee while the systemwide study is going on.

Steve Rainey said the systemwide study was discussed at the July 30 meeting; one concern raised was that the investigation of gas abatement strategies at both Grand Coulee and Chief Joseph is farther along than it is at other projects in the system. Until those other projects catch up, Rainey said, it will be difficult to assess where Grand Coulee and Chief Joseph fit into a systemwide set of priorities. In the meantime, we think it would be worthwhile to look at what structural and operational alternatives may provide some interim benefits at Chief Joseph and Grand Coulee.

Still, while the Bureau has this engineering team in place to look at the other five alternatives, it would make sense for them to evaluate the weir labyrinth as well, Woodin said. You're talking about a billion-dollar option, which is one of the reasons we're reluctant to give it serious consideration, McClendon said. I'm not trying to pin that entire billion dollars on the Bureau, Woodin said; all I'm saying is that, for the region as a whole, the weir labyrinth option may ultimately make sense. There's no reason why that option can't be included in the systemwide study, McClendon said.

After some minutes of discussion, McClendon said Reclamation simply doesn't have the available staff time to do the cost analysis on this alternative. Actually, I think a basic cost analysis has already been done, observed BPA's Phil Thor – it's Alternative 8, estimated cost \$600 million. Ron Boyce said ODFW would like an opportunity to discuss the possible continued evaluation of this alternative with WDOE and EPA; he will report back at the September SCT meeting. After some minutes of further discussion, no objections were raised to this course of action.

IV. Options for Continued Development/Testing or Deferral of John Day Extended-Length Screens.

Stuart Stanger of the Corps led this discussion; he distributed Enclosures E and F, a description of two extended-length screen options at John Day, and a memo outlining NMFS' views regarding continued development and testing of John Day extended screens, respectively.

Enclosure E lays out two implementation alternatives, Stanger explained. Under Option A, we would get a prototype screen system in the water for fish year 1999; the tradeoff is that it will not be possible to do much in the way of structural and mechanical testing prior to installation, so our design confidence would be lower, Stanger said. Under Option B, the prototype would go in the water for fish year '00, after more extensive structural, mechanical and biological testing, so our design confidence would be higher. In terms of funding, Option A is projected to cost \$4.3 million in FY'99, \$14.4 million in FY'00, \$16.6 million in FY'01 and \$7.5 million in FY'02 (total: \$42.8 million), while Option B is projected to cost \$2.5 million in FY'99, \$4.8 million in FY'00, \$22.5 million in FY'01 and \$10.7 million in FY'02 (total: \$40.5

million). Please see Enclosure E for details on installation schedule, advantages and disadvantages for each option.

We would like to make some decisions today, Stanger said, because there are a number of things the Corps needs to continue working on between now and the next SCT meeting – hydraulic modeling, cover hoist prototype plans and specs, orifice valves plans and specs, VBS sweep, maintenance pit plans and specs, feature design memorandum supplement, and advertisement of prototype contract. Depending on what you decide, he said, that work will either stop or proceed.

Various SCT participants weighed in on which option they prefer, and on the question of whether this work should proceed at all, given the ISAB's views on extended-length screens and anticipated FY'99 CRFM budgetary constraints. Ultimately, the group put it to a vote, with the following results:

Option A	OptionB
In FY'99 (Fast Track)	No Funding (Slower)

ODFW (w/caveat that the ISAB review the study plans)

WDFW CRITFC

NMFS NWPPC

USFWS IDFG (Go Slower)

BPA

(USBR abstained from voting).

Boyce said ODFW supports Option A, but would like the ISAB to review the project study plan before prototype construction proceeds, given their concerns about the adequacy of past biological tests. I don't think it would be possible for the ISAB to complete that review in time, said Ruff.

Ultimately, Witt Anderson summarized the outcome of this discussion by saying that what he is hearing is that the SCT, with the exception of CRITFC, possibly the Council and possibly IDFG, would like the Corps to keep its options open for now, including Option A. Ruff said he will check to see whether the Council actively opposes keeping Option A alive; Hevlin reiterated that he will confirm Idaho's position on this issue. If the Council and Idaho object to keeping Option A alive, Hevlin said, Jim and I will frame this issue for the Implementation Team, for resolution at the September 10 IT meeting. In response to a question, Steve Pettit said he will let Hevlin know whether Idaho actively opposes Option A, and would raise the issue to IT if the Corps decides to keep Option A alive.

V. Lower Granite Surface Bypass Evaluation Results.

Mark Lindgren of the Corps provided a presentation on results from the 1998 Lower Granite surface bypass collection test. Lindgren explained that the purpose of the 1998 test was to test two new surface bypass collection concepts: the first, a simulated Wells intake (SWI) incorporating the best understanding of the Wells technology, to see whether it would work at a lower river project; the second, a behavioral guidance structure.

Lindgren worked from a series of slides, copies of which are attached as Enclosure G; please see this document for details of Lindgren's presentation. In terms of results from the SWI test, Lindgren said the structure was designed to modify the flows away from the powerhouse to bring fish that were far away from the structure in closer. In 1998, 38% of all the fish coming downriver passed through the three-unit test structure with only 3% of the flow. Basically, Lindgren said, we doubled our performance from 1996 to 1997, and were very successful in moving fish up to the structure. However, we were not as successful in terms of the number of fish that actually entered the structure, he said – in 1998, we saw a lot more meandering and delay. The SBC was still the fastest route of passage, including spill, but passage was slower in 1998 than it has been in previous years – an important point, Lindgren said.

Moving on to spill effectiveness, Lindgren said one of the surprising things about the 1998 test was the level of effectiveness in terms of putting fish through the SBC and over the spillway. If you counted the number of fish that passed via Spillbay 1 and the spill fish, 73% of the fish passed via the spillway; with the other 27% passing via the powerhouse. If we shut off the spillway and passed fish via the SBC alone, we would have passed 58% of the fish through a spillway route and 42% via the powerhouse, he continued; if we shut off the SBC, and all we had was spill, we would have passed only 36% of the fish via the spillway and 64% via the powerhouse. The bottom line is that, compared to a spill effectiveness of 1.4:1, we ended up with a 9:1 effectiveness with the collector prototype, Lindgren said – in other words, in terms of operational flexibility, we saw quite a significant benefit from the 1998 test.

Lindgren continued on to results from the 1998 behavioral guidance structure test. According to the preliminary hydroacoustic data, 71% of the fish that would have gone to bays 1, 2 and 3 (which were blocked off by the collector prototype) were guided away. According to the radio-tracking data, 80% of the fish were guided away. Remember that this is a passive system, Lindgren said; the fish can go wherever they want to go, and this year, at least 71% of them chose to go where we wanted them to go. The bottom line is that, for a single year of testing, at least, the results were pretty good, he said.

Lindgren also distributed Enclosure H, the Lower Granite surface bypass and collection test plan for 1999. In general, he said, the Corps believes that it now has the most cost-effective way to develop SBC technology. In 1999, the Corps proposes to evaluate the Lower Granite SBC with higher-volume flows through the fish entrances near Units 4 and 5 by reducing the number of entrances, and by operating turbine Units 4, 5 and 6 at the low end of peak efficiency. If we do these things, Lindgren said, we think we can build a pretty good case for a 10%-15% improvement in SBC effectiveness. If we can do that, he said, we think we'll have confirmation of a stand-alone SBC that can be used without a backup screen system.

In addition, the Corps hopes to validate the 1998 BGS test data by testing with the guidance curtain "in" for the entire test period and by increasing the sample size. We will conduct an aggressive BGS test by operating turbine Units 1, 2 and 3 at the high end of peak

efficiency, Lindgren said. Please refer to Enclosure H for details of the goals and objectives, proposed research and other considerations associated with the planned 1999 SBC test at Lower Granite.

In terms of FY'99 costs, Lindgren said that to do the full prototype test laid out in Enclosure H will cost about \$5 million. If we reduce the scope to target only the most critical data, the FY'99 cost will be about \$3.5 million, he said. When will you have results from the summer portion of the 1998 test? Ruff asked. By the end of this month, Lindgren replied.

What's the timeline for a decision on this issue? Boyce asked. It's not imminent, but we need to be thinking about it, Lindgren replied. It's a decision that needs to be made in the context of the rest of our FY'99 budgetary priorities, Hevlin said – we can discuss this project further this afternoon, when we get into the details of the FY'99 program.

VI. Turbine Survival Program Status Update.

Ferguson said the purpose of this presentation is to reacquaint the SCT with the history of the turbine survival program, to provide an overview of recent results and work products from this program, and to discuss the future direction of the program in FY'99 and FY'00. The goal of the turbine survival program is threefold, Ferguson said: 1) to make near-term operational and cam optimization improvements that can be applied to all the family of units now on the river; 2) to probe and understand the turbine environment, in an effort to understand what causes physical injury to fish passing through the turbine units; and 3) based on these observations, decide what recommendations should be made in terms of Phase II actions.

I need to point out that this program is a joint effort involving many different entities, Ferguson said – the Corps, the Department of Energy, the PUDs, BPA and the Turbine Working Group, among others.

Ferguson said one key research tool used in understanding the turbine environment is the 1:25 scale sectional model of a McNary turbine unit at the Waterways Experiment Station. That is the main tool we've used in trying to identify the suspect areas, from a physical injury standpoint, in the machine, he said. Phase I of this project has also included an extensive program of field testing, to verify what we've seen in the laboratory, he explained. At the request of others in the region, we've also added a detailed evaluation of the new minimum-gap runner going in at Bonneville Powerhouse I, Ferguson said; in addition, the Phase I program includes the McNary cam optimization/near-term operational benefits study, a study at Bonneville of the possibility of going beyond 1%, and exporting the knowledge gained in these research efforts to the Lower Granite family of turbines.

Lindgren spent a few minutes talking about recent results from this research program, focusing mainly on the sectional model work, using neutrally-buoyant beads as a surrogate for juvenile fish, at WES. He showed a video, which used a high-speed camera to illustrate the response of these beads to the turbine environment, then offered the following conclusions and recommendations:

Conclusions

- ? New “tuning” methods appear to work.

? Operation limits can be better defined, in order to change optimize flexibility and fish survival.

Recommendations:

- ? Finalize the optimization of McNary Unit 5 by field testing.
- ? Apply the new data to remaining units at McNary.
- ? Apply knowledge gained at McNary to the family of units at Lower Granite, as a first step toward applying it systemwide.

Ferguson then provided an overview of FY'99 and FY'00 program costs:

FY'99:

- ? Cam Optimization: \$210,000
- ? Bonneville MGR Benefits: \$1.01 million
- ? McNary biological testing: \$1.015 million
- ? Support elements: \$ 975,000

FY'99 Total: \$3.210 million

The plan for FY'00 calls for a second year of testing at Bonneville and McNary, Ferguson said; the projected total cost is about \$3 million. In FY'01, the field work, modeling and cam optimization work will essentially be completed; most of our effort will be focused on the development of the final Phase I report, including our recommendations for Phase II, Ferguson said.

VII. Status of the FY'99 CRFM Budget.

Witt Anderson said that, according to everyone he has talked to in Washington D.C., it now appears very unlikely that Congress will appropriate the full CRFM amount requested for FY'98; the Senate side of the committee has approved \$95 million, while the House side has recommended considerably less – only \$7.8 million. In addition, he said, it appears likely that we will be operating under a continuing resolution, which, if true, will place some fairly significant constraints on what we're doing and how fast we're moving out in FY'99.

VIII. Ranking of FY'99 Program Items.

Hevlin drew the SCT's attention to Enclosure I, a packet of information titled "Ranking for 1999 SCT activities," dated August 10. As you'll recall, he said, this is where we left our list of activities – both study items and implementation items – at the last meeting. One of the suggestions at that meeting was that we make the scoring for study items and implementation items equivalent, Hevlin said – remember that, the way the criteria worked out, the highest

possible score for an implementation item was 96, while the highest possible score for a study item was 93. Since that meeting, Phil Thor has balanced those out through the use of a ratio, so that both study and implementation items have an equivalent score and we get a truer ranking of the relative priorities of these items; the results of this exercise can be found on the first and last pages of Enclosure I. Page 1 of the handout is a combined list of study and implementation items, ranked by Thor's equivalent scoring method.

In response to a question, Hevlin said he has not yet received rankings from Bob Heinith of CRITFC or Steve Pettit of IDFG. Pettit said he has completed his rankings, and that Hevlin should have received a copy by now. It was agreed to incorporate IDFG's rankings as soon as they are received.

I don't want to prejudice this process in any way, said Anderson, but I should point out that the Corps has a number of existing construction contracts that are very high on the list; there is also the payback of some of the money we borrowed for this year. In addition, it appears likely that we will be directed by Congress to fund at least two specific items: the Lower Snake Study and Phase I of the John Day Drawdown Study. What I'm trying to say, said Anderson, is that there is about \$36 million that is going to have to come off the top of whatever Congress appropriates, to pay for the items we're going to be obligated to do.

In response to a question, Anderson said this list of top-priority obligations for FY'99 includes \$4 million borrowed from Alaska in FY'98 that the Corps now has to repay, as well as \$20 million for the B2 Outfall DSM construction contract, \$4 million for the Ice Harbor end bay construction contract and \$8 million for the Lower Snake and John Day drawdown studies.

After some minutes of discussion, it was agreed to group these payback, current construction and FY'99 study obligations together as a package, total cost \$36 million, and make them the top-priority items on the list.

It was observed that the current list of 34 study items does not include funding for the flow deflector fast-track proposal discussed by the Corps earlier in today's meeting, or many of the items required in the 1998 steelhead Biological Opinion. Peters said the FY'99 cost of the DGAS fast-track proposal is estimated to be \$2.5 million; the adult fallback study at McNary and Ice Harbor identified as priorities in the 1998 steelhead BiOp, were estimated to cost \$100,000 in FY'99.

The group devoted the remainder of the meeting to reviewing this list of priorities and developing a revised list, with some items ranked higher, some ranked lower, and some with rankings unchanged. The revised list of SCT FY'99 budgetary priorities included below; new items added during today's meeting have been italicized.

SCT RANKING FOR 1999 CRFM ACTIVITIES SEPTEMBER

14, 1998

Study and Implementation Items Together

Ranking Equivalent Score Cost (\$ million) Cumulative Costs

S – JDA Drawdown

Study 600 \$3.730 \$3.730

S – SYS LSN
 Feasibility Study 600 \$4.200 \$7.930
 I – IHB Flow
 Deflectors 600 \$4.000 \$11.930
 I – BON PH2 DSM 600 \$20.000 \$31.930
 I – SYS Payback 600 \$4.000 \$35.930
 S – SYS Separator
 Evaluation 599 \$0.950 \$36.880
 S – LGR Model 599 \$0.100 \$36.980
 S – SYS Spill
 Effectiveness 450 \$1.000 \$37.980
 S – TDA
 Spillway/Sluiceway
 Survival 435 \$1.500 \$39.480
 I – BON PH1 DSM 407 \$2.950 \$42.430
 S – SYS Adult PIT 400 \$0.050 \$42.480
 I – MCN Extended
 Screens 386 \$4.429 \$46.909
 S – BON Adult
 Fallback 385 \$0.300 \$47.209
 S – BON PH1 FGE 380 \$1.700 \$48.909
 S – MCN-IHB Adult
 Fallback 374 \$0.100 \$49.009
 S – JDA Fish Ladder
 Jumping 374 \$0.500 \$49.509
 I – SYS Adult
 Passage (LGO) 374 \$2.050 \$51.559
 I -- LGR Extended
 Screens 369 \$1.334 \$52.893
 I – LGS Extended
 Screens 364 \$2.155 \$55.048
 S – SYS Gas
 Abatement 360 \$4.220 \$59.268
 S – SYS Gas
 Fasttrack 360 \$2.500 \$61.768
 S – BON Surface
 Bypass 357 \$10.755 \$72.523
 I – TDA Emergency
 Aux. Water Supply 352 \$0.500 \$73.023
 S – TDA Surface
 Bypass 351 \$2.700 \$75.723
 S – JDA Surface
 Bypass 345 \$3.590 \$79.313
 S – JDA Four-Unit
 Surface Collector 345 \$0.000 \$79.313
 S – BON PH2 FGE 341 \$1.200 \$80.513

S – LGR Surface
 Bypass 326 \$5.000 \$85.513
 S – SYS Turbine
 Passage 316 \$2.665 \$88.178
 I – JDA Monitoring
 Facility 311 \$2.350 \$90.528
 S – LCO Feasibility 290 \$0.500 \$91.028
 S – SYS Aux. Water
 LSN 285 \$0.100 \$91.128
 S – BON Flat Plate
 PIT 284 \$0.050 \$91.178
 S – SYS Fish Ladder
 Temp. Control 247 \$0.060 \$91.238
 S – JDA Ringold 237 \$0.200 \$91.438
 S – JDA Extended
 Screens 215 \$4.300 \$95.738
 S – BON PH2
 Gatewell Cleaning 0 \$0.750 \$96.488
 S – SYS Acoustic 0 \$1.550 \$98.038
 S – SYS Flume JDA 0 \$2.300 \$100.338
 S – SYS Spill Survival 0 \$0.000 \$100.338
 I – LGR JBS 0 \$0.400 \$100.738
 I – MCN Fish Ladder
 Exit Modifications 0 \$0.350 \$101.088
 I – JDA Flow
 Deflectors (1 & 20) 0 \$0.485 \$101.573

IX. Next SCT Meeting Date and Agenda Items.

The next meeting of the System Configuration Team was set for Wednesday, September 16, from 9 a.m. to 4 p.m. at NMFS' Portland offices. Meeting notes prepared by Jeff Kuechle, BPA contractor.